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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/576,767	05/24/2000	Yung-Soo Kim	030681-200	4658

21839 7590 10/23/2003

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EXAMINER

RYMAN, DANIEL J

ART UNIT	PAPER NUMBER
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2665

DATE MAILED: 10/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/576,767

Applicant(s)

KIM ET AL.

Examiner

Daniel J. Ryman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 May 2000.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4-8,11,15-21 and 24-29 is/are rejected.
- 7) ☒ Claim(s) 2,3,5-7,9,10,12-14, and 22-29 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 May 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6,7.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Information Disclosure Statement

1. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered. The references cited on pages 5, line 10-page 6, line 8; page 7, line 5-page 8, line 17; and page 21, line 8-page 22, line 2 have not been considered.

Drawings

2. The drawings are objected to because in Fig. 2, "N-IFFT 208" should be changed to "N-FFT 208" in order to agree with page 2, line 19 of the specification. In addition, "M-IFFT" on page 14, line 13 and page 17, line 6 of the specification appears as "N-IFFT" in Fig. 6 and Fig. 16, respectively. Further, on page 16, line 24 "N-FFT 1508" appears as "N-IFFT 1508" in Fig. 15 and 20. On page 18, lines 12-13 "L-FFT 2102" appears as "L-IFFT 2102" in Fig. 21. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

3. The abstract of the disclosure is objected to because it exceeds 150 words in length. Correction is required. See MPEP § 608.01(b).

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4. The disclosure is objected to because of the following informalities: on page 9, lines 8-17 it is disclosed that the signal is inverse fast Fourier transformed; however, on page 2, line 19 and page 10, lines 1-9 of the disclosure it is taught that an FFT is used when receiving. On page 17, line 19 "9" should be "19". On page 19, lines 15-16, the N-IFFTs would transform the signals to the time domain rather than the frequency domain. On page 19, lines 20-22 "N IFFT 2066 N-point fast Fourier transform" should be "N IFFT 2066 N-point inverse fast Fourier transform".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 4-7 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 4 discloses that the received signals are inverse fast Fourier transformed. The specification discloses that the received signals are fast Fourier transformed in order to convert the received time signal into a frequency domain signal (page 2, line 19 and page 10, lines 1-9). For the purposes of prior art rejections, claim 4 will be interpreted to read that the received signals undergo FFT rather than IFFT.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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8. Claims 17-20 and 24-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

9. Claims 17 and 24 recite the limitation "the virtual pilot tones and pilot tones added upon transmission" in lines 6-10. There is insufficient antecedent basis for this limitation in the claim. For the purposes of prior art rejections, "the virtual pilot tone and pilot tones added upon transmission" will be interpreted as "a virtual pilot tone and pilot tones added upon transmission".

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

11. Claims 1 and 8 are rejected under 35 U.S.C. 102(a) as being anticipated by Cimini et al (USPN 5,914,933).

12. Regarding claims 1 and 8, Cimini discloses a method and apparatus for transmitting orthogonal frequency division multiplexing (OFDM) signals, the method comprising the steps of and the apparatus comprising means for: coding the OFDM signals (ref. 21 and col. 2, line 63-col. 3, line 17); forming a block of N coded data (ref. 119; col. 2, line 63-col. 3, line 17; and col. 3, line 44-col. 4, line 56) and dividing the block into L M-sized small blocks, where N, M and L indicate integers of 1 or more, and $L = N/M$ (ref. 31; col. 2, line 63-col. 3, line 17; and col. 3, line 44-col. 4, line 56); M-point inverse fast Fourier transforming the L small blocks (ref. 41; col. 2,

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line 63-col. 3, line 17; and col. 3, line 44-col. 4, line 56); combining L M-point inverse fast Fourier transformed blocks, and generating an N-sized inversely-transformed block (ref. 45; col. 2, line 63-col. 3, line 17; and col. 3, line 44-col. 4, line 56); attaching a cyclic prefix to the N-sized inversely-transformed block (col. 5, line 56-col. 6, line 8); and transforming the blocks having the attached cyclic prefix, into an analog signal (ref. 47; col. 2, line 63-col. 3, line 17; and col. 3, line 44-col. 4, line 56) and transmitting the transformed analog signal (ref. 60; col. 2, line 63-col. 3, line 17; and col. 3, line 44-col. 4, line 56).

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cimini et al (USPN 5,914,933) in view of Daffara et al (USPN 5,687,165).

15. Regarding claims 4 and 11, Cimini discloses a method and apparatus for transmitting orthogonal frequency division multiplexing (OFDM) signals, the method comprising the steps of and the apparatus comprising means for: coding the OFDM signals (ref. 21 and col. 2, line 63-col. 3, line 17); forming a block of N coded data (ref. 119; col. 2, line 63-col. 3, line 17; and col. 3, line 44-col. 4, line 56) and dividing the block into L M-sized small blocks, where N, M and L indicate integers of 1 or more, and $L = N/M$ (ref. 31; col. 2, line 63-col. 3, line 17; and col. 3, line 44-col. 4, line 56); M-point inverse fast Fourier transforming the L small blocks (ref. 41; col. 2, line 63-col. 3, line 17; and col. 3, line 44-col. 4, line 56); combining L M-point inverse fast

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Fourier transformed blocks, and generating an N-sized inversely-transformed block (ref. 45; col. 2, line 63-col. 3, line 17; and col. 3, line 44-col. 4, line 56); attaching a cyclic prefix to the N-sized inversely-transformed block (col. 5, line 56-col. 6, line 8); transforming the blocks having the attached cyclic prefix, into an analog signal (ref. 47; col. 2, line 63-col. 3, line 17; and col. 3, line 44-col. 4, line 56) and transmitting the transformed analog signal (ref. 60; col. 2, line 63-col. 3, line 17; and col. 3, line 44-col. 4, line 56); and when receiving the signal, digitally converting received OFDM signals and obtaining a signal sample from the transformed signals (ref. 68 and col. 7, line 41-64) and detecting the starting point of an N-sized signal sample block from the signal samples (col. 7, line 41-64). Cimini does not expressly disclose a method and apparatus for receiving orthogonal frequency division multiplexing (OFDM) signals, the method comprising the steps of and the apparatus comprising means for: removing a cyclic prefix; dividing the signal sample block into L M-sized small blocks, where N, M and L are integers of 1 or more, and $L = N/M$; M-point fast Fourier transforming the L small blocks; combining the L M-point fast Fourier transformed small blocks, and generating an N-sized transform block; and detecting data from the N-sized transform block, and decoding the detected data. Instead, Cimini discloses, as a non-limiting example of a receiver, that, since clustering only applies at the receiver, can be implemented without explicitly performing the reverse of the clustering process (col. 7, line 35-64). However, it is well known in the art to perform the reverse process in the receiver as was performed in the transmitter in order to obtain the original signal, as is evidenced by Daffara (Fig. 4; col. 3, lines 24-25; and col. 3, line 37-col. 4, line 8). It would have been obvious to one of ordinary skill in the art at the time of the invention to perform the reverse

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process in the receiver as was performed in the transmitter in order to obtain the original signal, as is well-known in the art.

16. Claims 15, 16, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cimini et al (USPN 5,914,933).

17. Regarding claims 15 and 21, Cimini discloses a method and apparatus for transmitting orthogonal frequency division multiplexing (OFDM) signals, the method comprising the steps of and the apparatus comprising means for: encoding an input data sequence (ref. 21 and col. 2, line 63-col. 3, line 17), and converting encoded data to parallel data (ref. 119; col. 2, line 63-col. 3, line 17; and col. 3, line 44-col. 4, line 56); dividing the encoded data into blocks of predetermined sizes (ref. 119 and ref. 31; col. 2, line 63-col. 3, line 17; and col. 3, line 44-col. 4, line 56); transforming each block to a time domain signal (ref. 41; col. 2, line 63-col. 3, line 17; and col. 3, line 44-col. 4, line 56), and combining the time domain signals (ref. 45; col. 2, line 63-col. 3, line 17; and col. 3, line 44-col. 4, line 56); transforming pilot tones, which are to be inserted at positions, into time domain pilot signals (col. 4, lines 40-50 and col. 7, line 65-col. 8, line 14), and adding each of the pilot signals to the time domain signal of each block (col. 4, lines 40-50 and col. 7, line 65-col. 8, line 14); and converting the resultant signal of the transforming step to a serial signal (ref. 45; col. 2, line 63-col. 3, line 17; and col. 3, line 44-col. 4, line 56), adding a cyclic prefix to the converted signal (col. 5, line 56-col. 6, line 8), converting the resultant signal to an analog signal (ref. 47; col. 2, line 63-col. 3, line 17; and col. 3, line 44-col. 4, line 56), and transmitting the analog signal (ref. 60; col. 2, line 63-col. 3, line 17; and col. 3, line 44-col. 4, line 56). Cimini does not expressly disclose inserting "0" at the first position of each block after dividing the encoded data into blocks of predetermined sizes; however, Cimini

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does disclose adding a guard interval between the blocks (col. 5, line 56-col. 6, line 8), where it is implicit that a guard band placed on the start of the block would place the guard band between blocks. It is generally considered to be within the ordinary skill in the art to adjust, vary, select, or optimize the numerical parameters or values of any system absent a showing of criticality in a particular recited value. The burden of showing criticality is on applicant. In re Mason, 87 F.2d 370, 32 USPQ 242 (CCPA 1937); Marconi Wireless Telegraph Co. v. U.S., 320 U.S. 1, 57 USPQ 471 (1943); In re Schneider, 148 F.2d 108, 65 USPQ 129 (CCPA 1945); In re Aller, 220 F.2d 454, 105 USPQ 233 (CCPA 1055); In re Saether, 492 F.2d 849, 181 USPQ 36 (CCPA 1974); In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Since Cimini discloses the use of a guard interval, any value for the interval, including "0", would have been obvious, absent a showing of criticality by applicant.

18. Regarding claim 16, referring to claim 15, Cimini discloses that the block signal domain transformer comprises: a transmission deinterleaver for dividing the encoded data into L M-sized blocks (ref. 31; col. 2, line 63-col. 3, line 17; and col. 3, line 44-col. 4, line 56); a "0" inserter for inserting "0" at the first position of each block (col. 5, line 56-col. 6, line 8), an Lx(M-IFFT) for performing inverse fast Fourier transformation on each block (ref. 41; col. 2, line 63-col. 3, line 17; and col. 3, line 44-col. 4, line 56); and a transmission interleaver for combining the time domain signals with each other (ref. 45; col. 2, line 63-col. 3, line 17; and col. 3, line 44-col. 4, line 56).

Allowable Subject Matter

19. Claims 2, 9, and 22 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations

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of the base claim and any intervening claims. The method disclosed for dividing and combining blocks is not expressly disclosed in the prior art.

20. Claims 3, 10, and 23 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. The method disclosed for dividing and combining blocks is not expressly disclosed in the prior art.

21. Claims 5 and 12 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. The method disclosed for dividing and combining blocks is not expressly disclosed in the prior art.

22. Claims 6 and 13 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. The method disclosed for dividing and combining blocks is not expressly disclosed in the prior art.

23. Claims 7 and 14 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. The prior art does not fairly suggest fast Fourier transforming the signal, equalizing the signal, and inverse fast Fourier transforming the signal (equalizing the signal in the frequency domain) before dividing the signal into blocks, and then fast Fourier transforming the blocks (processing the signal).

24. Claims 17-20 and 24-29 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action. The prior art

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did not fairly suggest inserting a virtual pilot tone at predetermined positions of the frequency domain signal and extracting a virtual pilot tone and pilot tones added upon transmission.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J. Ryman whose telephone number is (703)305-6970. The examiner can normally be reached on Mon.-Fri. 7:00-5:00 with every other Friday off.

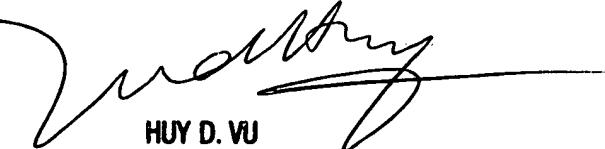
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (703)308-6602. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-3900.

Daniel J. Ryman
Examiner
Art Unit 2665

DSR

Daniel J. Ryman


HUY D. VU
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